## REMARKS

In this response, claims 1, 16, 34-36, 63, 67, 72, 80, and 82-85 have been amended, claims 33 and 64 have been canceled, and new claims 86-111 have been added. Thus, claims 1-32, 34-63, and 65-111 are now pending in the application. The Office Action issued by the Examiner has been carefully considered by Applicant. No new matter has been added to the application by the above claim amendments.

**Claims 1-83 have been rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-41 of (U.S. Patent No. 6,735,630) (Gelvin et al.). Furthermore, claims 1-83 have been provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-51 of co-pending Application No. 09/684,742.**

Applicant includes a terminal disclaimer with this response directed to the patent and application cited by the Examiner above. Applicant accordingly requests that these double patenting rejections be withdrawn.

**Claims 1-3, 11-12, 14, 16, 18, 21, 28-29, 32, 33, 36, 42-44, 46-47, 50-53, 56-61, and 80-83 have been rejected under 35 U.S.C. 102(e) as being anticipated by Clare et al. (U.S. Patent No. 6,414,955) (hereinafter "Clare").**

The Examiner's most recent argument is that Clare "clearly shows that a user node may receive and store data from the wireless sensor topology, which meets the limitation of distributing storage and processing of the collected data among the plurality of elements."

Although the Examiner discusses "distributing storage and processing" and "collected data," Applicant kindly reminds the Examiner that claim 1, for example, recites that "data processing is distributed" and does not recite the words "storage" or "collected."

As to Clare, Applicant emphasizes that the overall specification provided by Clare is directed to a method for learning the topology of a wireless network (col. 3: lines 35-37). In other words, Clare describes a method by which nodes may self-organize. Clare does not at all discuss any details regarding distribution of data processing after this self-organization has been completed. This is not at all surprising in that Clare is only directed to self-organization of a network, and any interest in Clare's teachings by one of ordinary skill in the art would extend only to this self-organization.

Applicant has amended independent claim 1 to recite that "the at least one node provides, after the plurality of network elements are self-assembled into a multi-cluster network, node information including node resource cost and message priority to the plurality of network elements" (emphasis added). As Clare is directed only to self-assembly, Clare does not teach or suggest that such node information be provided after self-assembly is completed. Further, claim 1 recites that the "data processing is distributed through the sensor network . . . in response to the node information" (emphasis added). It should be noted that this distribution is in response to the node information, which is provided (per the recitation in claim 1) after self-assembly is completed. In contrast, Clare stops teaching or suggesting anything of relevance to amended claim 1 once the self-assembly method of Clare is described as complete. Accordingly, Clare does not teach or suggest the foregoing recitations of Applicant's claim 1.

More specifically, the operation of the network in Clare involves communication between inviting and new nodes that occurs during self-organization of the sensor network. In this regard, Clare describes communication between nodes in the network that occurs during this organization (*see*, e.g., col. 8: lines 49-51). Further, Clare describes that communication schedules are shared amongst nodes so that radio communication interference is avoided (*see*, e.g., col. 9: lines 24-32; and col. 13: lines 2-8).

After the topology associated with a new node that joins the network is learned, Clare describes the new node as now being a member node of the network (col. 14: line

25), and that the new node characterization method may then be repeated to add other new nodes (col. 14: lines 26-28).

The above concludes the overall description provided by Clare. Notably, although Clare describes that each node may contain one or more sensors 12 to sense local environmental conditions (col. 18: lines 36-38), and that data collected by these sensors may be processed on the node (i.e., local node processing of sensor collected data) (col. 18: lines 42-56), Clare does not anywhere discuss a manner of distributing data processing through the sensor network.

Clare does describe that microprocessor 20 can control and schedule communications with other nodes (col. 18: lines 56-60), yet this communications is clearly referring to the topology learning method (i.e., self-assembly method) described throughout the full extent of Clare and the sharing of communication scheduling required to implement the topology learning method. Also, Clare describes that DSP 18 or microprocessor 20 may process signal data acquired by the sensors "on the node" (col. 20: lines 28-50). Yet, after the topology learning has been completed, Clare does not describe that any data processing of any type is distributed through the sensor network (e.g., other sensor nodes in the network) for purposes of distributing data processing.

In support of his position that Clare does show distributed processing, the Examiner has cited col. 16: lines 5-16, which describes a "sink" or connection to the network permitting access by a user. Clare also describes that the user may want to tap the network for information without disturbing the topology (col. 16: lines 13-15). It should be noted, however, Clare is describing a "sink" test that is performed as part of the overall method used in self-assembly of Clare's network. This sink test is shown in Fig. 12, which illustrates the self-assembly method, and is part of learning the topology (i.e., whether a sink is attached) for the new node.

The Examiner has also cited col. 6: lines 10-30, of Clare, which discusses that sensors may detect vibration, seismic signals, infrared signals . . . or any other detectable physical phenomena, as teaching the collection of data from the environment. Presumably, this is the data that the Examiner is attempting to show is an example in Clare of distributed data processing. But all of the Examiner's references to Clare's teachings of distribution of information are related to node information for purposes of network self-organization and do not teach or suggest providing of node information or distribution of data processing in a sensor network that has completed assembly. Clare does not teach or suggest how such sensor data is to be processed in a distributed manner.

The Examiner also asserts that a user node may receive data from the network and this itself would be sufficient to show distribution of data processing "through the sensor network" as recited by Applicant's claim 1. Applicant's amended claim 1 now recites that distribution is through a sensor network that includes "at least one of the plurality of network elements other than the at least one client computer" to make clear that distribution solely to a client computer (e.g., user node) will not satisfy the recitations of claim 1. In other words, a network element that is not a client computer must be included in the distribution of data processing. However, the client computer may be a part of the distribution of data processing in addition to such network element.

Applicant's claim 1 also recites that data processing is distributed "in response to the node information" (emphasis added). The Examiner has asserted that Clare shows node resource information such as "identity, location, communication and interference neighbors, etc.". Yet, one of ordinary skill in the art would clearly read the overall text of Clare to say that this information is associated with the topology learning method described throughout the body of Clare's patent (indeed, there is essentially nothing else to Clare's description other than this topology learning method). Clare does not teach providing of node information "including node resource cost and message priority" after self-assembly as recited in Applicant's amended claim 1.

Further, the Examiner has not addressed how Clare teaches that the use of information associated with a topology learning method teaches distributed data processing in response to node information after assembly. Clare could not be considered to make this connection because Clare is directed to learning a network topology, and not to distributing data processing. Certainly, Clare does not explicitly describe such a connection as would support the anticipation rejection made here by the Examiner.

In light of the above arguments, Applicant requests that the anticipation rejection of claim 1 be withdrawn. Applicant's independent claims 80 and 83 are believed allowable for similar reasons as discussed above.

Applicant's dependent claim 28, which depends from Applicant's claim 1, recites that "the at least one node controls data processing and data transmission in response to a decision probability of a detected event." The Examiner references Clare (col. 15: lines 10-15) as teaching this recitation. However, this section of Clare only describes the starting of certain processing on nodes in the network, such as sensing of activity in the environment or implementing instructions from a user (col. 15: lines 12-24). Clare does not teach or suggest a probability of a detected event, or the controlling of data processing and data transmission in response to this probability.

**Claims 30, 45, and 55 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Clare in view of Official Notice.**

Applicant made a full prior response with respect to claims 30, 45, and 55 as required under 37 CFR 1.111(b), in that Applicant pointed out specific distinctions believed to render these claims patentable (i.e., through their dependency upon independent claim 1). In that the Official Notice of the Examiner is moot (i.e., not necessary to the making of Applicant's prior response regarding claims 30, 45, and 55), Applicant asserts that a challenge to such Notice is not required at this time. Whether a challenge is seasonable must take into account whether a challenge to Official Notice is

necessary to Applicant's response. Here, that is not the case. Further, the policy goals of the U.S. Patent and Trademark Office to reduce application pendency are best served by not unnecessarily requiring legal argument from Applicant or the Examiner where such argument is legally moot at the time of response.

To the extent that may be required to respond to the Examiner's assertion regarding Official Notice, Applicant challenges the Notice as to claim 30 as improperly taking Notice of an external sensor as to "the node" of applicant's invention. The Examiner's Notice should not have such a nexus to Applicant's claimed invention. Applicant requests that the Examiner provide a supporting reference as to the suggestion of the application of an external sensor to "the node" in this context.

As to claim 45, Applicant challenges the generality of the Official Notice as insufficient to teach or suggest claim 45. The Notice should not extend to use of compact entry in a codebook or to the advantage of conserving bandwidth in a low-power system. Applicant requests that the Examiner provide a supporting reference as to the suggestion of the application of codes in this context.

As to claim 55, Applicant challenges the generality of the Official Notice as insufficient to teach or suggest claim 55. The Notice should not extend to wireless sensor networks. Applicant requests that the Examiner provide a supporting reference as to the suggestion of the application of public key security protocol in this context.

**Claims 4-10, 13, 17, 19, 25, 38-41, 48-49, 62-79, and 84-85 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Clare in view of Myer et al. (U.S. Patent No. 6,615,088) (hereinafter "Myer").**

Applicant's independent claim 63 as amended now recites that "the at least one node provides, after the plurality of network elements are self-assembled into a multi-cluster network, node information including node resource information and message

priority to the plurality of network elements, wherein data processing is distributed in the sensor network in response to the node information" (emphasis added).

Claim 63 is believed allowable for similar reasons as discussed above for Applicant's claim 1. As was true for Clare, Myer also does not teach or suggest providing the node information, including node resource information and message priority as recited in claim 63, after the plurality of network elements are self-assembled. Instead, as the Examiner has stated several times, Myer simply discloses a method of device interface configuration for a control system (col. 1: lines 27-28). Myer's method is focused solely on introducing new devices into the control system and providing configuration information so that the new device can be interfaced to the system (*see* col. 9: lines 20-28).

Similarly as for Clare, Myer is focused solely on initial configuration processes and does not discuss any data processing after assembly is completed. Further, Myer does not discuss any distribution of data processing in response to node information (e.g., message priority) after assembly of the network. Instead, Myer focuses only on communications to perform the initial interface configuration.

Applicant's independent claim 84 recites that "a plurality of levels of synchronization are supported among different subsets of the plurality of network elements." As the Examiner has stated, Clare does not disclose such supporting a plurality of levels of synchronization.

The Examiner cites Myer as teaching that a master controller 36 can periodically poll each device in control area network 30 to monitor its status (col. 3: lines 15-22). However, the mere fact that polling of devices is described here does not itself teach or suggest a manner of synchronizing on a plurality of levels. It only teaches that controller 36 is managing communications with several devices controlled by controller 36 and that the communications conflicts are prevented due to polling by controller 36. There is no suggestion that multiple levels of synchronization be used. Further, varying the time of

polling to correspond to the speed with which each device is able to communicate as the Examiner suggests would still not teach a plurality of levels of synchronization.

Applicant's independent claim 85 recites that "data is transferred using message packets, and wherein the message packets are aggregated into compact forms in the at least one node." The Examiner has stated that Clare does not disclose aggregating data processed in a plurality of nodes for further processing by other nodes. The Examiner refers again to the same section of Myer describing polling as discussed above. Myer does not teach or suggest any aggregation of message packets into compact forms by this description of polling. Instead, Myer merely describes obtaining the status of several devices—compacting or aggregation of this status information is not discussed by Myer.

Applicant made a full prior response with respect to claim 39 as required under 37 CFR 1.111(b), in that Applicant pointed out specific distinctions believed to render these claims patentable (i.e., through their dependency upon independent claim 1). In that the Official Notice of the Examiner is moot (i.e., not necessary to the making of Applicant's prior response regarding claim 39), Applicant asserts that a challenge to such Notice is not required at this time. Whether a challenge is seasonable must take into account whether a challenge to Official Notice is necessary to Applicant's response. Here, that is not the case.

To the extent that may be required to respond to the Examiner's assertion regarding Official Notice, Applicant challenges the generality of the Official Notice as insufficient to teach or suggest claim 39. The Notice should not extend the alleged well-known mere use of two or more sensors to support the proposition that cooperative sensing to provide non-local event correlation as recited is notoriously well-known. Applicant requests that the Examiner provide a supporting reference as to this alleged well-known application of cooperative sensing in support of this Official Notice.

**Claims 15 and 54 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Clare in view of Davis et al. (U.S. Patent No. 5,742,829) (hereinafter "Davis").**

Applicant's dependent claim 15, which depends from independent claim 1 discussed above, recites that "code and data anticipated for future use are predistributed through the sensor network using low priority messages." The Examiner has stated that Clare does not disclose distributing code and data anticipated for future use through the sensor network using low priority messages. The Examiner cites Davis as disclosing a network that distributes code and data in the background. However, Davis is solely focused on the automatic installation of software (e.g., providing of updates for new versions of an installed program) (see col. 2: lines 31).

Applicant's claim 15 recites "data anticipated for future use." But Davis does not discuss the predistributing of any data, and further does not suggest distributing "data anticipated for future use" since the sole focus and motivation of Davis is to ensure that software code is kept up-to-date. Further, Davis does not discuss a sensor network, so any data distributed would not correspond to future use in a sensor network.

**Claims 19, 20, and 31 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Clare in view of Makansi et al. (US 2002/0154631) (hereinafter "Makansi").**

Claim 31, which depends indirectly from independent Applicant's claim 1, recites that "data gathered by the at least one sensor is processed and a predetermined identifying code representing the data is propagated through the network" (emphasis added). As mentioned above, Clare is focused on a method of self-assembly for a network, and there is little discussion of processing of data that is gathered by sensors. Where such processing is discussed, Clare describes the local processing (e.g., using a DSP) of the data on the node at which such data was collected. Clare does not teach or suggest that any code

representing the data be propagated through the network. Makansi, as the Examiner has indicated, discloses the transmitting of dummy data within packets (*see* Abstract) and does not suggest the use of an identifying code representing data gathered by a sensor.

Claims 19 and 20 depend, directly or indirectly, from Applicant's independent claim 1 and are believed allowable for at least the reasons discussed above for claim 1.

**Claims 9, 22-24, 27, and 37 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Clare in view of Humpleman et al. (U.S. Patent No. 6,546,419) (hereinafter "Humpleman").**

Claims 9, 22-24, 27, and 37 depend, directly or indirectly, from Applicant's independent claim 1 and are believed allowable for at least the reasons discussed above for claim 1.

**New independent claims 92, 95, 97, 101, 103, and 106 have been added.**

Claim 92 recites that "data gathered from the monitored environment by the at least one sensor is processed and a predetermined identifying code representing the gathered data is propagated through the network" (emphasis added). Claim 92 is believed allowable for similar reasons as discussed above for Applicant's claim 31.

Claim 95 recites that "data gathered from the monitored environment by the at least one sensor is processed to reach a decision at the at least one node, and a summary message corresponding to the decision is forwarded through the network" (emphasis added). As discussed above, Clare focuses on self-assembly and only briefly discusses processing of sensor data locally on the gathering node. It is believed that claim 95 is allowable for at least the foregoing recitations.

Claim 97 recites that "after the plurality of network elements are self-assembled into a multi-cluster network, the network automatically re-routes around any subsequent

node communication failures that occur when remotely controlling a function of at least one of the plurality of network elements" (emphasis added). Clare is focused on methods prior to the completion of self-assembly as discussed above. Clare does not teach that automatic re-routing occurs after assembly has been completed when remotely controlling a function of the network. Claim 97 is believed allowable over the prior art at least for this recitation.

Claim 101 recites that "code and data anticipated for future use are predistributed through the sensor network using low priority messages." Claim 101 is believed allowable for similar reasons as discussed above for Applicant's claim 15.

Claim 103 recites that "the at least one node controls data processing and data transmission in response to a decision probability of a detected event." Claim 103 is believed allowable for similar reasons as discussed for Applicant's claim 28 above.

Claim 106 recites that "the plurality of network elements are self-assembled into a multi-cluster network, wherein a start node is selected as a base node, and wherein the base node communicates an assembly packet throughout the network" (emphasis added). Clare does not teach or suggest self-assembly of a wireless network wherein a base node communicates an assembly packet throughout the network as recited by Applicant. Claim 106 is believed allowable over the prior art for at least this recitation.

**Conclusion**

It is respectfully submitted that the Examiner's rejections have been successfully traversed and that the application is now in order for allowance. Applicant believes that any of the Examiner's other arguments not discussed above are moot in light of the above arguments, but reserves the later right to address these arguments. Accordingly, reconsideration of the application and allowance thereof is courteously solicited.

Any dependent claims not discussed above are believed allowable for at least the reasons discussed above with respect to the independent claims from which such claims depend. If it is helpful to advance prosecution of this application, Applicant's representative welcomes a telephone call at the number below to discuss this response.

Respectfully submitted,

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